

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN/OR RELATING TO WEB WINDING CORES

(71) We, EASTMANN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America of 343 State Street, Rochester, New York 14650, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to web winding cores having attached thereto an adhesive element for releasably attaching one end of a web of photographic material to the core.

According to the present invention there is provided a web winding core having attached thereto an adhesive element for releasably attaching one end of a web of photographic material to the core, wherein the adhesive element comprises a tape which is coated on one side with a first, complete layer of a pressure-sensitive adhesive and on the other side with a second, partial layer of a pressure-sensitive adhesive, the adhesive element being attached to the winding core by means of the first, complete adhesive layer.

According to the present invention there is also provided a material comprising a web winding core having releasably attached thereto one end of a web of photographic material by means of an adhesive element, wherein the adhesive element comprises a tape which is coated on one side with a first, complete layer of a pressure-sensitive adhesive and on the other side with a second, partial layer of a pressure-sensitive adhesive, the adhesive element being attached to the winding core by means of the first complete adhesive layer and to the web of photographic material by means of the second, partial adhesive layer.

By the term "web" of photographic material we mean a web of any flexibly supported photographic film or paper.

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Several methods of carrying the invention into effect will now be described with reference to the adhesive elements constructed for use in the present invention and illustrated in the accompanying drawings in which:

Fig. 1 is an enlarged longitudinal section, in perspective, of a material constructed in accordance with one embodiment of the present invention;

Fig. 2 is an enlarged perspective view showing how the individual elements shown in Fig. 1 may be fabricated by a continuous procedure and in a way which facilitates a dispensing of the individual elements for their successive use;

Fig. 3 is a schematic view illustrating how the end of a web is attached to a winding core by an element constructed as shown in Figs. 1 and 2;

Fig. 4 is a schematic perspective view of a winding core having attached thereto another and preferred embodiment of web attaching element;

Fig. 5 is a schematic view illustrating the end of a web attached to a winding core by an element constructed as shown in Fig. 4;

Fig. 6 is an enlarged perspective view showing how the individual elements as shown in Fig. 4 may be fabricated by a continuous procedure and in a way which facilitates a dispensing of the individual elements for their successive use; and

Fig. 7 is a schematic view illustrating how the elements fabricated according to the technique illustrated in Fig. 6 may be individually dispensed for use.

Referring now to Fig. 1, wherein one embodiment of a material for use in the present invention is shown, an element T comprises a narrow tape 10 e.g.,  $\frac{1}{2}'' \times 2''$ , of polyester film base, or other suitable material, completely coated on one side with a layer 11 of

an acrylic pressure-sensitive adhesive and having half the length of its other side coated with a layer 12 of the same acrylic pressure-sensitive adhesive so that the coating is spaced from one end of the tape 10. The adhesive layer 12 is protected by a first release sheet 13 stuck thereto. The layer of adhesive 11 on the other side is protected by a second release sheet 14 stuck thereto. In order to facilitate pulling the double coated polyester base from the release sheet 13 the release sheet 14 is provided with a pull tab 16 which extends beyond the end of the tape 10. When one grasps this pull tab between the fingers and pulls upwardly, the double adhesive coated tape 10 along with the release sheet 14 will be peeled off the release sheet 13 leaving the adhesive layer 12 exposed. Using the pull tab 16 as a handle the exposed adhesive layer 12 is first pressed against an end of a web W, see Fig. 3, and then the release sheet 14 is pulled off to expose the other adhesive layer 11. The end of the web w is then stuck to the periphery of a winding core 18 by the adhesive layer 11, see Fig. 3. If the operator grasps the pull tab 16 between the thumb and forefinger in applying the tape 10 to the end of the web W after the lower release sheet 13 is removed, he is then able to align the web W when attaching it to the core 18 by means of his thumb. Preferentially, the adhesive on the tape 10, particularly the layer 12 to be stuck to the end of the web W, is coloured black so that it may be readily seen when it is applied to the end of a photographic paper or film which is light-colored. While the adhesive connection between the tape 10 and the web W should be such that it will give way before the adhesive connection between the tape 10 and the core 18, it must be sufficiently strong to hold while the tape 10 is being initially pulled onto the core 18, otherwise windup of the web W cannot be accomplished.

When the web W is unwound from the core 18 the element T will generally remain on the core 18 because the mechanical arrangement stresses the bond between the web W and the tape 10 in peel as shown by the angle  $\theta$  in Fig. 3, while the bond between the tape 10 and core 18 is stressed in shear. The shear strength of adhesive always exceeds the peel strength. In addition, the area of the bond under peel stress, that formed by the adhesive layer 12, is one half that of the bond under shear, that formed by the adhesive layer 11.

In order to facilitate the manufacture and the ultimate dispensing of the elements T they can be manufactured in a manner shown in Fig. 2. A long tape 10 of polyester film base, two inches wide, is completely coated on one side with the layer 11 of an acrylic pressure-sensitive adhesive and has one half the length of the other side coated with the

layer 12 of the same acrylic pressure-sensitive adhesive so that the coating is spaced from one margin of the tape 10. In covering relation with the adhesive layer 12 there is a first, elongated sheet 13, 2" wide, which may be made of a heavy kraft paper since this is to provide a support for a multiplicity of the elements T. In covering relation with the layer 11 of adhesive there is a second elongated release sheet 14 of parchment release paper which is slightly wider than two inches to provide the pull tabs 16. This composite material is then "dinked" in  $\frac{1}{2}$ " widths, as indicated by lines 30 in Fig. 2, by means of a tool, not shown, which will cut through the parchment release paper of the release sheet 14, the tape 10 and the two adhesive layers 11 and 12 thereon but not through the kraft release paper of the release sheet 13. By manufacturing the elements I in this manner a single strip of kraft release paper will serve as a support for a number of the elements T so that they can be rolled up for packaging and then each individual element I can be pulled from the kraft release paper as it is unrolled by merely pulling up on the pull tabs 16.

While there has been shown and described the double coated element T, which is completely coated on one surface with the layer 11 of adhesive and one half coated on the other surface with the layer 12 of the same adhesive, and which element T is first attached to the end of the web W and then to the core 18, it will be appreciated that the two sides of the tape 10 could be coated with a different pattern of adhesive and the order of attachment of the element T to the web W and core 18 could be changed. For example, as shown in Fig. 4 the side of an element T' which is to be adhered to the web W is provided with an adhesive coating 12' which occupies approximately the centre half of the full length of a tape 10' so that the coating is spaced from both ends of the tape 10'. After removal of a release sheet, not shown, the underside of the element T' which is completely covered with an adhesive layer 11' is first attached to the core 18. Then, after removal of release sheet (not shown) from the adhesive layer 12' the end of the web W is pressed against the adhesive layer 12' for attaching it to the core 18.

Looking particularly at Figs. 4 and 5, since the adhesive layer 12' is located at the central portion only of the element T' there remains at each end of this adhesive layer 12' clear areas 40 where there is no adhesive connection between the element T' and the web W. As will be evident from an inspection of Fig. 5 this means that as the web W is unwound from the core 18 the end of the web W will peel completely from the element T' before there is any chance of the adhesive connection between the element T' and the

core 18 being placed under a peel stress rather than a shear stress. Leaving a clear area 40 on the tape 10' on both sides of the adhesive layer 12' insures that the desired separating conditions between the web W and element T' will occur regardless of the circumferential orientation of the element T' on the core 18, and will prevent even the leading edge of the element T' from being placed under a peel stress during unwinding of the web W, which peel stress might tend to cause the element T' to peel off the core 18 rather than off the web W.

Elements such as T' may be fabricated so as to facilitate their being dispensed individually in much the same manner as described above in connection with the element T. Referring now to Fig. 6, a long tape 10' of polyester film base, two inches wide, is completely coated on one side with the layer 11' of an acrylic pressure-sensitive adhesive and has the centre half of the other side coated with a layer 12' of the same acrylic pressure-sensitive adhesive so that the coating is spared from both margin of the tape 10'. In covering relation with the adhesive layer 12' there is a first elongated release sheet 14' of parchment release paper which is the same width as the tape 10'. In covering relation with the adhesive layer 11' is a second, elongated release sheet 13', two inches wide, of release paper which may be made of a heavy kraft paper since this is to provide a support for a multiplicity of the elements T'. This composite sheet is then "dinked" in  $\frac{1}{2}$ " widths, as indicated at lines 30' in Fig. 6, by means of a tool, not shown, which will cut through the parchment release paper of the release sheet 14', the tape 10' and the two adhesive layers 11' and 12' thereon, but not through the kraft paper of the release sheet 13'. By manufacturing the elements T' in this manner a single strip of kraft paper will serve as a support for a plurality of the elements T' so that they can be rolled up for packaging and then each individual element T' can be pulled from the kraft paper as it is unrolled.

As indicated in Fig. 7, if the roll of the elements T' fabricated as shown in Fig. 6 is dispensed from a dispenser having a sharp edge about which the kraft paper is sharply bent as it is pulled out then no pull tabs are required on the elements T' to permit their removal from the release sheet 13'. When the release sheet 13' is sharply bent about a sharp corner 20 of the dispenser as it is pulled out in the direction indicated by an arrow 21 it will be peeled from a leading edge 22 of the leading element T', as indicated in Fig. 7, thus leaving this leading edge of the element T' available to be gripped by the fingers so as to be completely stripped from the release sheet 13'. This peeling of the leading edge of the leading element T' from

the release sheet 13' as the latter is pulled sharply about the sharp corner 20 results because the tape 10' of each element T' has a resistance to bending in a direction transversely of its length which is sufficient to cause the adhesive layer 11' to peel from the release sheet 13' as shown in Fig. 7. As each element T' is removed from the release sheet 13' it is stuck to the core 18 in the manner shown in Fig. 4 after which the release sheet 14' is then pelled off the adhesive layer 12' so that the end of the web W may be stuck thereto as shown in Fig. 5. If the core 18 is black, as is often the case in practice, then the adhesive layer 12' can be made white so that the position of the element T' on the core 18 will be clearly apparent.

It will be appreciated that the patterns and/or the adhesive characteristics of the adhesive layers on the two sides of the tape 10 or 10' could be different from that shown in order to assure that the element T or T' remains with the core. For example, the adhesive coating on the side of the tape 10 and 10' adapted to engage the end of the web W could be made in a spaced dot or stripe pattern while that on the other side covers the complete surface. Also, adhesives having different adhesion characteristics could be used on opposite sides of the tape 10 or 10'. Also, any web material having a sufficient flexibility and strength could be used for the tape 10 or 10'.

#### WHAT WE CLAIM IS:—

1. A web winding core having attached thereto an adhesive element for releasably attaching one end of a web of photographic material to the core, wherein the adhesive element comprises a tape which is coated on one side with a first, complete layer of a pressure-sensitive adhesive and on the other side with a second partial layer of a pressure-sensitive adhesive, the adhesive element being attached to the winding core by means of the first, complete adhesive layer.

2. A web winding core having attached thereto an adhesive element, according to claim 1, in which the second, partial layer of a pressure-sensitive adhesive is placed from at least one end of the tape.

3. A web winding core having attached thereto an adhesive element for releasably attaching one end of a web of photographic material to the core substantially as herein described.

4. A material comprising a web winding core having releasably attached thereto one end of a web of photographic material by means of an adhesive element, wherein the adhesive element comprises a tape which is coated on one side with a first, complete layer of a pressure-sensitive adhesive and on the other side with a second, partial layer of a pressure sensitive adhesive, the adhesive ele-

ment being attached to the winding core by means of the first, complete adhesive layer and to the web of photographic material by means of the second, partial adhesive layer.

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